

ISS and Human Research Project Office Highlights September 24, 2010

ISS Research Program

CFE-2 Interior Corner Flow 1 module image acquired of setup geometry in JEM.

The still images of Shannon Walker operating Capillary Flow Experiment-2 (CFE-2) in the International Space Station Japanese Experiment Module (JEM) were downloaded to the Johnson Space Center data system on September 21, 2010. This is the first time CFE-2 was operated in the JEM, and this image was used to verify the setup geometry for the camera. The NASA Glenn researchers were provided access to the system and downloaded the image below.

The CFE-2 Interior Corner Flow 1 (ICF1) module was operated by Increment 24 Flight Engineer Shannon Walker on September 8-9, 2010. This was the second set of operations for this particular CFE-2 vessel. The real-time video downlink was unavailable in the JEM during the early September CFE-2 operations. The video data was downlinked over the weekend and the Principal Investigator (PI) is reviewing the science data. (POC: RET/Robert D. Green and MAH/Robert Hawersaat)



ISS024E014167

Increment 24 Flight Engineer Shannon Walker operating CFE-2 Interior Corner Flow 1 (ICF1) unit.

Two additional test point achieved in the MDCA/FLEX on the ISS.

Two test points were achieved on September 16-17, 2010 for the Multi-User Droplet Combustion Apparatus/Flame Extinguishment Experiment (MDCA/FLEX). These test points were performed in gas mix CR13 (i.e., 0.7 atm with 17% O₂ / 45% CO₂ / balance N₂). Twenty-two test points have been accomplished for a 100 total test points for MDCA/FLEX since the new fuel deployment needles were installed on August 25, 2010. Additional test points using heptane fuel are scheduled for the first week of October. (POC: MAH/J. Mark Hickman, (216) 977-7105)

CVB paper to be presented at AIChE November meeting.

A paper titled: The Constrained Vapor Bubble Experiment – results from the International Space Station will be presented at the annual meeting of the American Institute of Chemical Engineers (AIChE), November 7-12, 2010, by the CVB Science team (Arya Chatterjee, Professor Joel Plawsky and Professor Peter Wayner). (POC: MAH/Ronald Sicker, (216) 433-6498)

Invited Abstract Submitted on the Applied Spaceflight Environments (ASE) Office Concept.

An abstract entitled “A Coordinated Effort to Address Space Weather and Environment Needs” was invited for submission to the 2010 Conference on Space Environment Applications, Systems, and Operations for National Security (SEASONS) to be held at the Johns Hopkins University Applied Physics Laboratory in Laurel, MD on November 3-5, 2010. This multi-center paper outlines a concept to establish a NASA Headquarters Applied Spaceflight Environments (ASE) Office that will provide coordination and funding for sustained multi-program support in three technical areas: (1) natural environments characterization and modeling, (2) environmental effects on materials and systems, (3) and operational and forecasting space environments modeling. Additionally the ASE office would serve as an entry point of contact for external users who wish to take advantage of data, tools and assets associated with space environments, including space weather. The authors are James Spann (MSFC), David Edwards (MSFC), Howard Burns (MSFC), Dennis Gallagher (MSFC), Mike Xapsos (GSFC) and Kim de Groh (GRC). This work is supported by the ISS Research Project (POC: RES/Kim K. deGroh, (216) 433-2297).

Materials International Space Station Experiment-X (MISSE-X) Concept Abstract Accepted.

An abstracted entitled “Materials on International Space Station Experiment-X (MISSE-X)” has been accepted for presentation at the 2011 IEEE Aerospace Conference to be held March 5-12, 2011 in Big Sky, Montana. This paper is being authored by Sheila A. Thibeault, Stuart A. Cooke, Melissa P. Ashe and Rudolph J. Saucillo of NASA Langley Research Center (LaRC), and Kim K. de Groh, Donald A. Jaworske, and Quang-Viet Nguyen of NASA Glenn Research Center (GRC) and is based on the MISSE-X proposal submitted to NASA Headquarters in response to the International Space Station (ISS) Utilization Technology Research Development Test and Evaluation Round Two Call for Proposals. Although ground-testing is used for predicting the effects of exposure to atomic oxygen, radiation, and other potential hazards to spacecraft systems, accelerated ground-based testing does not always replicate in-space degradation. The synergistic effects of the combined space environment and the effects of long-exposure, low dose-rate radiation are two critical effects that can only be achieved on-orbit.

Hence, the ISS is an ideal platform for space environmental exposure studies. Many space programs have benefited from the very successful current MISSE project, which began in August 2001 and continues today. However, with the impending retirement of the Space Shuttle, the launch and delivery of the current MISSE payload, in its present form, cannot continue. Therefore, NASA Glenn Research Center and NASA Langley Research Center have teamed up to propose MISSE-X, a new concept for an external ISS platform to follow the previous highly successful MISSE missions. Other collaborators on this concept include NASA Johnson Space Center (JSC) and the Department of Defense (DoD) Space Test Program. MISSE-X is specifically designed for space environmental effects studies in the post-Shuttle era by utilizing robotic deployment of a common plug-and-play modular experimental carrier (MEC) and advanced avionics (to be led by GRC) for active data acquisition and telemetry in order to advance the technology readiness of materials and devices critical for future space exploration. MISSE-X is envisioned to accommodate up to 90% active experiments. It provides a common platform through the MEC that leverages the ISS infrastructure to support the power and communication needs of active experiments, thereby allowing researchers to focus their resources on experiment development. This work is supported by the ISS Research Project (POC: RES/Kim K. deGroh, (216) 433-2297, RES/Donald A. Jaworske, (216) 433-2312 and RES/Quang-Viet Nguyen, (216) 433-6147).